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REMARKS/ARGUMENTS

Claims 1-20 are pending. Claims 1-4, 6-10 and 12-16 are amended. Support for the amended claims can be found in the specification. Claims 19 and 20 are added. Support for the added claims can be found, for example, in FIG. 3A, page 9, lines 16-11, page 11, lines 6-9, and page 15, line 25 to page 16 line 1. Figure 7 is amended. Support for the change can be found, for example, on page 18, lines 8-12. No new matter has been introduced.

Claim 7 is objected to for an informality. Claim 7 has accordingly been amended to correct the typographical error. Applicants respectfully request withdrawal of the rejection.

Claims 1-4, 6-10, 12, 13, 15 and 16 are rejected under 35 U.S.C. § 112 as being indefinite for providing insufficient antecedent basis. Claims 1-4, 6-10, 12, 13, 15 and 16 have accordingly been amended to provide sufficient antecedent basis. Applicants respectfully request withdrawal of the rejection.

Claims 1, 2, 7, 8, 13 and 14 are rejected under 35 U.S.C. § 102(e) as being anticipated by Shillo (US 2003/0110263).

Applicants respectfully submit that independent claims 1, 7 and 13 as amended are novel and patentable over Shillo because, for instance, Shillo does not teach or suggest a management server connected to a plurality of servers to manage storage areas included in storage apparatuses as virtual storage areas; wherein said storage apparatuses are shared by said plurality of servers; and said storage apparatuses include assignment areas which are storage areas assigned to at least one of said plurality of servers; said management server being responsive to an area assignment instruction of storage areas exceeding unassigned areas received from one of said plurality of servers to release at least part of said assignment areas of other servers as unassigned areas and assign the released areas to one of said plurality of servers. This is shown and described, for instance, in FIG. 1 and at page 5, line 22 to page 7, line 6.

In contrast, Shillo discloses a managing server 150 that identifies all the storage resources connected to network 100 and collects them into a virtual storage pool 160. See page 3, paragraph 42. Server 150 detects how much disk space each application actually consumed and reallocates virtual storage resources to each application according to its actual needs and

level of usage. The reallocation process then takes over the unused portions of the storage resources and allocates them to applications that need them for their actual operation. See page 3, paragraph 43.

However, Shillo also teaches that the applications need to be aware of the availability of the remaining resources even though the applications do not actually operate on them. In particular, Shillo teaches that "[i]n order to properly operate, the application requires the remaining 5 GB to be available on its allocated disk, but hardly ever (or never) uses them." See page 3, paragraph 43. Thus, in Shillo there remains the problem that reallocating the remaining resources not used by the applications causes uncertainty about whether the applications can still actually operate without them. Accordingly, some measure is necessary to insure that the applications can actually operate without failures. For this reason, server 150 creates virtual storage volumes 161, 162 and 163 for application servers 121, 122 and 123 "to assure that the applications whose resources were exempted will still run without failures." See page 4, paragraph 46. This additional measure of creating the virtual storage volumes contributes to the added complexity of the system taught by Shillo.

In sum, Shillo teaches comparing the difference between the storage spaces requested by applications and storage spaces actually needed by them, then reallocating this difference to other applications that actually need them. But the system in Shillo faces the problem that there is no guarantee that the managing server can assign unused space to another application that requests it without the additional backup storage measures in place, or that the applications can even operate after reallocation without failures.

Accordingly, there is no teaching or suggestion in Shillo that when the management server receives from a server an area assignment instruction exceeding unassigned areas, the management server releases at least part of assignment areas of the other servers (such as unused areas in the other servers or storage areas of the other servers in which low priority data is stored) as unassigned areas and assigns the released areas to said server.

For at least the above reasons, independent claims 1, 7, 13 and claims depending therefrom are patentable. Dependent claims 2-6, 8-12 and 14-20 recite additional features not

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disclosed or suggested in the cited art. Accordingly, Applicants respectfully request withdrawal of the rejection.

Claims 3, 4, 9, 10, 15 and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shillo, in view of Naik et al. (US 2004/0205206).

Applicants respectfully submit that claims 3, 4, 9, 10, 15 and 16 as amended are patentable over Shillo and Naik et al. because, for instance, they do not teach or suggest a management server being responsive to an area assignment instruction of storage areas exceeding unassigned areas received from one of said plurality of servers to release at least part of said assignment areas of other servers as unassigned areas and assign the released areas to one of said plurality of servers.

As noted above, Shillo fails to disclose the above limitations. Naik et al. fails to cure the deficiency of Shillo. Naik et al. merely discloses a management system for managing and reserving storage bandwidth. See page 5, paragraph 61. There is no teaching or suggestion in Naik et al. that when a management server receives from a server an area assignment instruction exceeding unassigned areas, the management server releases at least part of assignment areas of the other servers as unassigned areas and assigns the released areas to said server.

For at least the above reasons, claims 3, 4, 9, 10, 15 and 16 are patentable. Accordingly, Applicants respectfully request withdrawal of the rejection.

Claims 5, 6, 11, 12, 17 and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shillo, in view of Karpoff (US 2003/0135385).

Applicants respectfully submit that claims 5, 6, 11, 12, 17 and 18 as amended are patentable over Shillo and Karpoff because, for instance, they do not teach or suggest a management server being responsive to an area assignment instruction of storage areas exceeding unassigned areas received from one of said plurality of servers to release at least part of said assignment areas of other servers as unassigned areas and assign the released areas to one of said plurality of servers.

As noted above, Shillo fails to disclose the above limitations. Karpoff fails to cure the deficiency of Shillo. Karpoff merely discloses a system that lowers the cost of SSP

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businesses by enabling the hosting of many consumers from a single large pool of electronic data storage rather than many smaller pools. See page 4, paragraph 50. There is no teaching or suggestion in Karpoff that when a management server receives from a server an area assignment instruction exceeding unassigned areas, the management server releases at least part of assignment areas of the other servers as unassigned areas and assigns the released areas to said server.

For at least the above reasons, claims 5, 6, 11, 12, 17 and 18 are patentable. Accordingly, Applicants respectfully request withdrawal of the rejection.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,

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Amendments to the Drawings:

The attached sheet of drawing replaces the original sheet of drawing including Figure 7. An annotated sheet showing the changes made to Figure 7 is attached.

Attachments: Replacement Sheets
                       Annotated Sheet Showing Changes

FIG.7

AREA RETURN PROCESSING 606

SEARCH STORAGE POOL
ASSIGNMENT INFORMATION 300
FOR VIRTUAL STORAGE AREA
HAVING MOST UNUSED BLOCKS

700

VIRTUAL STORAGE AREA
HAVING UNUSED BLOCK DETECTED ?

702

~~YES~~ *NOT DETECTED*

~~NO~~ *DETECTED*

704

SEARCH STORAGE POOL
ASSIGNMENT INFORMATION 300
FOR VIRTUAL STORAGE AREA
HAVING MOST BLOCKS
IN WHICH LOW-PRIORITY DATA IS STORED

ISSUE AREA RETURN INSTRUCTION 450
TO SERVER 130 MAKING ASSIGNMENT OF
DETECTED VIRTUAL STORAGE AREA

706

UNASSIGNED AREA
HAVING REQUIRED SIZE IS INSUFFICIENT ?

708

YES

NO

END OF PROCESSING